

ATTACHMENT D

URAC[®] 185 resin

DESCRIPTION

URAC 185 resin is a modified urea-formaldehyde resin in a liquid state. When used as an adhesive it yields craze-resistant glue lines up to 0.02" thick. It may be used for gluing wooden structures where a thin glue line cannot be obtained because of inadequate pressure on irregular surfaces. It is an ideal "gap filling" adhesive.

ADVANTAGES

- Craze resistance, low shrinkage - URAC 185 resin gives excellent bonds in glue line thicknesses up to 0.20".
- Bonding temperature - URAC 185 resin may be cold or hot set at temperatures 70°F to 125°F.
- Low pressure - URAC 185 resin can be used with hydraulic presses, screw-type presses or hand clamps.
- Quality of bond - URAC 185 resin provides highly moisture resistant bonds meeting the performance requirements for Federal Specification MMM-A-188, Type III.

APPLICATIONS

URAC 185 resin is suitable for the following applications: Furniture, sporting goods, millwork, joint assemblies, hollow core doors. Decorative laminates to plywood, i.e., "Masonite" or lumber cores for dinette, sink, and counter tops. Also steam heated automatic core machines, high frequency core gluers and heated clamp carriers.

INSTRUCTIONS FOR USE

URAC 185 resin is formulated for use by the addition of CYCAT[®] 185 catalyst. The hardener is a light tan powder consisting of inorganic curing agents and a figneous filler.

In the formulation of this adhesive, the ratio of filler-to-resin has been carefully worked out. The craze-resistance and low-pressure-bonding properties depend entirely upon this balanced formulation. The thinning of URAC 185 resin with water or other resin is not recommended.

Although this adhesive can be used for some flat panel work where special considerations prevail, it is not intended for general application as a plywood adhesive. Its appropriate application is in gluing of wooden structures where inadequate pressure or irregularity of shape of contacting surfaces make it impossible to attain uniformly thin glue lines.

In many cases, it is feasible to spread URAC 185 resin on mechanical spreaders requiring a consistency similar to conventional urea-formaldehyde resin glues. In many other applications, knife, spatula, or brush spreading are indicated; thick glue lines require an adhesive of heavier consistency to meet job requirements. Within the limits given below, the craze-resistance and quality of bond will not be impaired by variation of consistency.

Parts by Weight	Consistency		
	Thin	Medium	Thick
URAC 185 resin	100	100	100
CYCAT 185 catalyst	10-13	13-16	16-18

PROCEDURE FOR MIXING

The resin may be mixed by hand in small quantities, but the use of a standard, double action mixer is strongly advised. Add the desired quantity of URAC 185 resin to the mixer, start the agitation, and slowly add the desired weighted quantity of hardener. Continue the agitation until a smooth, lump-free mixture results.

WORKING LIFE

As soon as mixed, the glue is ready for application to the wood. It is now activated and will continue to react until completely set.

If heat is to be applied to the glue line, it is often advantageous to lengthen the working life by maintaining the glue mix at a temperature of 60°F or lower. The glue should, however, be applied to wood which is at a temperature in excess of 70°F.

CYTEC

CYTEC INDUSTRIES INC.
Bonding & Laminating Resins
www.cytec.com
800-243-6874 (Telephone orders)
203-284-5550 (FAX orders)

BLT-669-A

PREPARATION OF WOOD

Wood surfaces should be reasonably smooth, free of torn fibers, and clean. Wood for gluing with URAC 185 resin should have a moisture content of 7 percent minimum and 15 percent maximum, and the humidity in the plant should be high enough to maintain a minimum equilibrium moisture content of 7 per cent.

SPREADING URAC 185 RESIN

The glue may be spread by mechanical spreader, brush, spatula, or by any conventional type of applicator, as long as the proper mix is chosen for the method of application. Typical spreads are similar to those used in hot or cold pressing and depending on conditions, usually range from 65 to 80 pounds for 1,000 square feet of double glue line.

PRESSING

Pressing should be accomplished to provide the minimum possible glue line thickness. Glue lines of over .020 inch thickness are not recommended.

Pressing time depends on temperature, humidity, species of wood, and whether the assembly is stressed in clamping, or is seriously stressed in removal from the clamps. It is assumed that the wood is at room temperature, which is important.

AGING PERIOD

(For Structural Applications Only)

In order that cold-clamped joint-work may develop its full water resistance and full strength, assemblies should not be exposed to temperatures less than 70 °F until five days have elapsed after the gluing operation.

No aging period is necessary following hot pressing to develop full water resistance and joint strength. However, it is desirable to condition flat panels in bales for several days for optimum warp stability.

STORAGE AND STABILITY

URAC 185 resin and CYCAT 185 catalyst should be stored in their original closed containers. Steel, enamel, paper or earthenware containers are recommended for handling small quantities in the shop. Spreaders and brushes should be cleaned immediately after use with water at 70 °F to 125 °F.

Useful life of URAC 185 resin also depends upon the temperature to which it is exposed:

<u>Temperature</u>	<u>Useful Life</u>
60°F	12 months
75°F	6 months
90°F	3 months

HEALTH AND SAFETY

The estimated acute oral (rat) LD50, acute dermal (rabbit) LD50 and the 4-hour Inhalation (rat) LC50 values for this material are 850 mg/kg, 630 mg/kg and 3.9 mg/l respectively. Direct contact with this material may cause moderate eye and skin irritation. Repeated or prolonged dermal contact with this material may cause allergic skin reactions. Inhalation overexposure may cause irritation of the respiratory tract and eyes. Before handling this material, read the corresponding Cytec Industries Material Safety Data Sheet for safety, health and environmental data.

IMPORTANT NOTICE

The information and statements herein are believed to be reliable but are not to be construed as a warranty or representation for which we assume legal responsibility or as an assumption of a duty on our part. Users should undertake sufficient verification and testing to determine the suitability for their own particular purpose of any information, products or vendors referred to herein. NO WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE IS MADE. Nothing herein is to be taken as permission, inducement or recommendation to practice any patented invention without a license.

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**MATERIAL SAFETY DATA**

MSDS No: 00143
Date: 11/01/1999
Supersedes: 07/01/1997

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: URAC® 185 Adhesive Resin

SYNONYMS: None

CHEMICAL FAMILY: Urea-formaldehyde resin; CAS No. 9011-05-6

MOLECULAR FORMULA: Mixture

MOLECULAR WGT: Mixture

CYTEC INDUSTRIES INC., FIVE GARRET MOUNTAIN PLAZA, WEST PATERSON, NEW JERSEY 07424,
USA

For Product Information call 1-800/852-6013. Outside the USA and Canada call 1-973/357-3193.

EMERGENCY PHONE: For emergency involving spill, leak, fire, exposure or accident call CHEMTREC:
1-800/424-9300. Outside the USA and Canada call 1-703/527-3887.

2. COMPOSITION/INFORMATION ON INGREDIENTS**OSHA REGULATED COMPONENTS**

COMPONENT	CAS. NO.	%	TWA/CEILING	REFERENCE
Furfuryl alcohol	000098-00-0	26.0	50 ppm 10 ppm (skin) 15 ppm STEL	OSHA ACGIH ACGIH
Formaldehyde	000050-00-0	4.0	0.75 ppm 2 ppm STEL 0.3 ppm (ceiling)	OSHA OSHA ACGIH NTP - 2 IARC - 2A

3. HAZARDS IDENTIFICATION**EMERGENCY OVERVIEW**

APPEARANCE AND ODOR: Yellow, cloudy, viscous liquid; slight formaldehyde odor

STATEMENTS OF HAZARD:

WARNING! VAPOR IRRITATING
HARMFUL IF ABSORBED THROUGH SKIN
CAUSES EYE IRRITATION
MAY CAUSE ALLERGIC SKIN REACTION

CHRONIC HAZARD WARNING:

POTENTIAL CANCER HAZARD - CONTAINS FORMALDEHYDE
INHALATION OF FORMALDEHYDE VAPOR
CAUSED CANCER IN LABORATORY ANIMAL TESTS
Risk of cancer depends on duration and level of exposure.

POTENTIAL HEALTH EFFECTS**EFFECTS OF OVEREXPOSURE:**

The estimated acute oral (rat) LD50 and acute dermal (rabbit) LD50 and 4-hour inhalation (rat) LC50 values for this material are 850 mg/kg, 690 mg/kg and 3.9 mg/l respectively.

Direct contact with this material may cause moderate eye and skin irritation.

Repeated or prolonged dermal contact with this material may cause allergic skin reactions.

Inhalation overexposure may cause irritation of the respiratory tract and eyes.

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Refer to Section 11 for toxicology information on the OSHA regulated components of this product.

4. FIRST AID MEASURES

In case of skin contact, immediately wash affected areas with soap and plenty of water. Remove contaminated clothing and shoes. Obtain medical attention. Destroy or thoroughly clean shoes before reuse. Do not reuse contaminated clothing without laundering.

In case of eye contact, immediately irrigate with plenty of water for 15 minutes. Obtain medical attention if irritation persists or if otherwise necessary.

If vapor or dust of this material is inhaled, remove from exposure. Administer oxygen if there is difficulty in breathing. Obtain medical attention immediately if necessary.

5. FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES

FLASH POINT: >200 F; 93 C

METHOD: Closed Cup

FLAMMABLE LIMITS

(% BY VOL): 1.8 Lower; 16.3 Upper; (values for furfuryl alcohol)

AUTOIGNITION TEMP: 736 F; 391 C

DECOMPOSITION TEMP: Not available

EXTINGUISHING MEDIA AND FIRE FIGHTING INSTRUCTIONS

Use water spray, carbon dioxide or dry chemical to extinguish fires. Use water to keep containers cool. Wear self-contained, positive pressure breathing apparatus and full fire-fighting protective clothing. See Section 8 (Exposure Controls/Personal Protection) for special protective clothing.

6. ACCIDENTAL RELEASE MEASURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Where exposure level is not known, wear NIOSH approved, positive pressure, self-contained respirator. Where exposure level is known, wear NIOSH approved respirator suitable for level of exposure. In addition to the protective clothing/equipment in Section 8 (Exposure Controls/Personal Protection), wear impervious boots. Cover spills with some inert absorbant material; sweep up and place in a waste disposal container. Flush area with water.

7. HANDLING AND STORAGE

Avoid breathing vapor. Avoid contact with eyes. Avoid prolonged or repeated contact with skin and clothing. Keep container closed. Use with adequate ventilation. Wash thoroughly after handling.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS AND PERSONAL PROTECTIVE EQUIPMENT (PPE)

Where this material is not used in a closed system, good enclosure and local exhaust ventilation should be provided to control exposure. Food, beverages, and tobacco products should not be carried, stored, or consumed where this material is in use. Before eating, drinking, or smoking, wash face and hands with soap and water. Avoid skin contact. Protective clothing such as impervious gloves, apron, workpants, long sleeve work shirt, or disposable coveralls are recommended to prevent skin contact. For operations where eye or face contact can occur, wear eye protection such as chemical splash proof goggles or face shield. Eyewash equipment and safety shower should be provided in areas of potential exposure. Where exposures are below the Permissible Exposure Limit (PEL), no respiratory protection is required. Where exposures exceed the PEL, use respirator approved by NIOSH for the material and level of exposure. See "GUIDE TO INDUSTRIAL RESPIRATORY PROTECTION" (NIOSH). Since this material contains a component with a skin notation with its

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PEL as shown in the regulated components section, additional skin protection such as a protective suit may be required.

It is recommended that a shower be taken after completion of workshift especially if significant contact has occurred. Work clothing should then be laundered prior to reuse. Street clothing should be stored separately from work clothing and protective equipment. Work clothing and shoes should not be taken home.

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE AND ODOR: Yellow, cloudy, viscous liquid; slight formaldehyde odor

BOILING POINT: 338 F; 170 C; (value for furfuryl alcohol)

MELTING POINT: -18 F; -28 C; (value for furfuryl alcohol)

VAPOR PRESSURE: Not available

SPECIFIC GRAVITY: 1.28

VAPOR DENSITY: 3.4; (value for furfuryl alcohol) (air = 1)

% VOLATILE (BY WT): -30

pH: Not available

SATURATION IN AIR (% BY VOL): Not available

EVAPORATION RATE: >1; (Butyl acetate = 1)

SOLUBILITY IN WATER: Appreciable

10. STABILITY AND REACTIVITY

STABILITY: Stable

CONDITIONS TO AVOID: None known

POLYMERIZATION: May Occur

CONDITIONS TO AVOID: None known

INCOMPATIBLE MATERIALS: Furfuryl alcohol can react violently with strong acids; strong oxidizing agents.

HAZARDOUS DECOMPOSITION PRODUCTS: Thermal decomposition or combustion may produce carbon monoxide, carbon dioxide, formaldehyde, oxides of nitrogen, ammonia and/or hydrogen cyanide.

11. TOXICOLOGICAL INFORMATION

Toxicological information for the product is found under Section 3. HAZARDS IDENTIFICATION. Toxicological information on the OSHA regulated components of this product is as follows:

Furfuryl alcohol has acute oral (rat) and dermal (rabbit) LD₅₀ values of 88 mg/kg and 400 mg/kg, respectively. The 4-hour inhalation LC₅₀ (rat) value is 233 ppm (0.93 mg/L). Direct contact with furfuryl alcohol can cause moderate eye and mild skin irritation. Inhalation overexposure to furfuryl alcohol vapor may cause dizziness, nausea, and irritation or injury of the respiratory tract.

Formaldehyde has oral (rat) and dermal (rabbit) LD₅₀ values of 100 mg/kg and 270 mg/kg, respectively. The LC₅₀ following a 4-hour inhalation exposure to rats is 250-478 ppm. Irritation of the nose and throat has been observed in people exposed to formaldehyde vapor levels in excess of 1 ppm. Normal breathing may be seriously impaired at levels above 10 ppm and serious lung damage can occur at levels exceeding 50 ppm.

Formaldehyde has been reported to cause pulmonary hypersensitivity in some individuals who were exposed to concentrations known to cause irritation; however, no pulmonary sensitization has been demonstrated in laboratory animal studies. Formaldehyde solutions can cause severe eye and moderate skin irritation.

Repeated skin exposure to solutions of 2% or more formaldehyde has caused allergic skin reactions.

Formaldehyde was found to be weakly mutagenic in a number of in vitro genotoxicity tests and positive in certain in vivo screening tests for mutagenicity. Formaldehyde did not cause birth defects in rats inhaling concentrations up to 10 ppm. However, a study using higher levels did show a slight but statistically significant reduction in male fetal body weight. Lifetime inhalation of formaldehyde vapor at concentrations above 5 ppm for 8 hours per day, caused nasal tumors in laboratory animals. Epidemiology studies have failed to link cancer

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In humans with occupational exposure to formaldehyde, inhalation caused liver and kidney damage in laboratory animal tests. Formaldehyde (gas) is a chemical known to the State of California to cause cancer. California Proposition 65 Warning (applicable in California only) - This product contains (a) chemical(s) known to the State of California to cause cancer.

12. ECOLOGICAL INFORMATION

No aquatic LC50, BOD, or COD data available.

OCTANOL/H₂O PARTITION COEF.: Not available

13. DISPOSAL CONSIDERATIONS

The information on RCRA waste classification and disposal methodology provided below applies only to the Cytec product, as supplied. If the material has been altered or contaminated, or it has exceeded its recommended shelf life, the guidance may be inapplicable. Hazardous waste classification under federal regulations (40 CFR Part 261 et seq) is dependent upon whether a material is a RCRA "listed hazardous waste" or has any of the four RCRA "hazardous waste characteristics." Refer to 40 CFR Part 261.33 to determine if a given material to be disposed of is a RCRA "listed hazardous waste"; Information contained in Section 15 of this MSDS is not intended to indicate if the product is a "listed hazardous waste." RCRA Hazardous Waste Characteristics: There are four characteristics defined in 40 CFR Section 261.21-61.24: Ignitability, Corrosivity, Reactivity, and Toxicity. To determine Ignitability, see Section 5 of this MSDS (flash point). For Corrosivity, see Sections 9 and 14 (pH and DOT corrosivity). For Reactivity, see Section 10 (incompatible materials). For Toxicity, see Section 2 (composition). Federal regulations are subject to change. State and local requirements, which may differ from or be more stringent than the federal regulations, may also apply to the classification of the material if it is to be disposed. Cytec encourages the recycle, recovery and reuse of materials, where permitted, as an alternate to disposal as a waste. Cytec recommends that organic materials classified as RCRA hazardous wastes be disposed of by thermal treatment or incineration at EPA approved facilities. Cytec has provided the foregoing for information only; the person generating the waste is responsible for determining the waste classification and disposal method.

14. TRANSPORT INFORMATION

This section provides basic shipping classification information. Refer to appropriate transportation regulations for specific requirements.

SHIPPING NAME:	D.O.T. SHIPPING INFORMATION TOXIC LIQUID, ORGANIC, N.O.S.	IMO SHIPPING INFORMATION TOXIC LIQUID, ORGANIC, N.O.S.
HAZARD CLASS/ PACKING GROUP:	DIVISION 6.1 III	6.1 III
UN NUMBER:	UN2810	2810
IMDG PAGE:	Not Applicable	6270-1
D.O.T. HAZARDOUS SUBSTANCES:	(PRODUCT REPORTABLE QUANTITY) FORMALDEHYDE (2,500 lbs)	Not Applicable
TRANSPORT LABEL REQUIRED:	Toxic	Toxic
SHIPPING NAME:	ICAO/IATA TOXIC LIQUID, ORGANIC, N.O.S.	TRANSPORT CANADA POISONOUS LIQUID, N.O.S.